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facts on the origin of the markings of caterpillars. The author describes the nature and morphology of the markings of larvæ of the family Sphingidæ, their biological value and tribal development, concluding that the oldest Sphingid caterpillars were without markings; that the oldest style of markings were longitudinal lines, the later ones oblique streaks, and the last to be developed, the spots. This part of the subject is illustrated by five colored plates. In the third section the transformation of the Mexican axolotl into an Amblystoma is discussed at considerable length, and with characteristic thoroughness. Professor Weismann believes that the Siredon or axolotl was originally derived from a land salamander (Amblystoma), but has reverted to an axolotl, or larval form, through the change of the climate of Mexico from a damp to an exceedingly dry one, obliging these animals, which as larvæ, lived in ponds, and as adults lived under fallen trees and stones or in damp places, to revert to the original larval Siredon form and remain permanently amphibious. In the fourth division, on the mechanical conception of nature, the author maintains that development is mechanical, and that we must reject the idea of a special life-force. Still he as strongly believes in teleology, and maintains the thesis that evolutional views do not tend to materialism.

GLOVER'S ILLUSTRATIONS OF INSECTS.[1] — This is a large quarto volume, containing ten excellent copper-plates illustrating the leading types of plant-bugs (Hemiptera not including the Homoptera), with 132 pages of text, a fac-simile of the author's own handwriting, printed on prepared lithographic paper. The letterpress contains useful lists of predaceous or parasitic bugs (Heteroptera), of the vegetable or animal substances destroyed by them, and of remedies against their attacks used or suggested by various writers. The value of the work is greatly increased by the aid of Mr. P. R. Uhler, "who has materially assisted in preparing the work by furnishing the specimens from which to figure, for advice and correcting the text, for the classification and valuable notes." The edition consists of but fifty or sixty copies for private distribution, and is a storehouse of useful information for agriculturists, which we wish could be more widely published.

LOVÉN'S STUDIES ON THE ECHINOIDS.[2] — This elaborate memoir presents matter of special interest to the palæontologist as well as to the zoölogist and anatomist. Chiefly zoölogical in its character, the text and plates are mostly devoted to a discussion of the homologies of the shell of the sea-urchins, particularly those forms related to extinct genera of echinoids. Comparisons are also instituted with the classes of

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[1] *Manuscript Notes from my Journal, or Illustrations of Insects, Native and Foreign. Order Hemiptera, Suborder Heteroptera, or Plant-Bugs.* By TOWNSEND GLOVER. Washington, D. C. 1876. 4to, pp. 132.

[2] *Études sur les Échinoïdés.* Par S. LOVEN. (Kongl Svenska Vetenskaps-Academiens Handlingar. Bandet II., No. 7.) Text and Atlas of 53 Plates. Stockholm. 1875. 4to, pp. 91.

Asteroids (star-fish) and Crinoids, which will, if we mistake not, be found of much use to palæontologists. Especial attention is devoted to certain organs called *Spherides*, grouped around the mouth of sea-urchins, for the discovery of which naturalists are indebted to Professor Lovén.

But to our mind the most interesting portion of the work is the exquisite drawings illustrating the anatomy and distribution of the nervous system and the water system of vessels. We have here for the first time, clearly shown, the more intimate relations of these organs.

The plates are abundant and beautifully executed, the lithographs rivaling in clearness and delicacy the best steel engravings.

MACALISTER'S ANIMAL MORPHOLOGY.[1] — Though this book was written in 1873, it is still the most recent manual of animal morphology in the English language, and will be found by advanced teachers to be very useful. The system of classification is that of Haeckel as modified by Huxley, and is based on recent embryological studies. The sponges are regarded as belonging to a distinct subkingdom, *Polystomata* of Huxley. The *Labyrinthuleæ* of Cienkowsky are admitted as a class of Protozoa. The Mollusca are regarded by the author, and we think correctly, as "only an extreme of specialization" of Vermes; in another place (page 241), "Their structure can be easily understood by regarding them as Vermes with no articulated appendages, modified by unequal lateral development, and by a fusion of metameres." For convenience they are regarded as a subkingdom. The Tunicates are placed among the Vermes in accordance with Gegenbaur's classification. The Polyzoa are placed among the Vermes, while rather inconsistently (probably because Gegenbaur first did so) the Brachiopoda are retained among the Mollusca. The volume ends with the Insects; a second volume, containing the Vertebrates, has just been issued from the press. Had we space to be critical we should feel inclined to find some fault with the author's classification of the Arthropoda, which he does not, however, claim to be original.

RECENT BOOKS AND PAMPHLETS. — Report on the Transportation Route along the Wisconsin and Fox Rivers, in the State of Wisconsin, between the Mississippi River and Lake Michigan. By Gen. G. K. Warren. Washington. 1876. 8vo, pp. 114. With Ten Maps.

The Grotto Geyser of the Yellowstone National Park. With a Descriptive Note and Map, and an Illustration by the Albert-type Process. (U. S. Geological and Geographical Survey of the Territories, F. V. Hayden, U. S. Geologist-in-Charge.) Washington, D. C. Folio.

The History of Spontaneous Generation. By Edward S. Dunster, M. D. (From Transactions of the Ann Arbor Scientific Association. Vol. i. 1871.) Ann Arbor. 8vo, pp. 30.

Über Dimorphismus und Variation einiger Schmetterlinge Nord Amerikas. Briefliche Mittheilung von J. Boll in Texas. 1876. 4to, pp. 3.

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[1] *An Introduction to Animal Morphology and Systematic Zoölogy.* By ALEXANDER MACALISTER, Professor of Comparative Anatomy and Zoölogy, University of Dublin. Part I. Invertebrata. London: Longmans, Green, & Co. 1876. 12mo, pp. 461. With a few Cuts.